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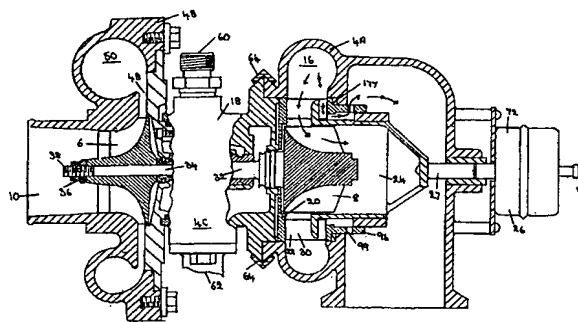
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(54) Title: VARIABLE TURBOCHARGER APPARATUS WITH BYPASS



(57) Abstract: Variable turbocharger apparatus (2) comprising a housing (4), a compressor (6) mounted for rotation in the housing (4), a turbine (8) mounted for rotation in the housing (4), a first inlet (10) for enabling air to be conducted to the compressor, an outlet (12) for enabling air from the compressor to be conducted to an engine, a second inlet (14) for enabling exhaust gases from the engine to be conducted to the turbine (8) in order to rotate the turbine (8), a chamber (16) which surrounds the turbine (8) and which receives the exhaust gases from the second inlet (14) before the exhaust gases are conducted to the turbine (8), and a bearing assembly (18) for permitting the rotation of the turbine (8), the variable turbocharger apparatus (2) comprising vanes (22) which are mounted in the chamber (16) and which are for accurately directing exhaust gases on to the turbine (8), a piston (24) which is slidable and which is positioned between the housing and the turbine (8), and control means (26) which is connected to the piston (24) and which is for controlling the sliding movement of the piston (24), the piston (24) having an end (28) which is nearest the bearing assembly (18) and which defines a gap (30), the size of the gap (30) being variable in dependence upon the sliding of the piston (24) under the control of the control means (26), the size of the gap (30) being effective to control the amount of the exhaust gases that act on the turbine (8) thereby accurately controlling the speed of rotation of the turbine (8) and thereby the amount of air conducted by the compressor through the outlet (12) to the engine, and the variable turbocharger apparatus (2) having at least one bypass aperture (99) which is closed when the size of the gap (30) is at a minimum and which opens when the gap (30) reaches a predetermined size, the opening of the bypass aperture (99) being such as to allow exhaust gases that are not required for acting on the turbine (8) to bypass the turbine (8).

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